REMARKS

The application has been amended to place the application in condition for allowance at the time of the next Official Action.

The specification is amended to include section headings and to add a brief description of Figures 5 to 10 to address the specification objection noted in the Official Action.

Claims 1-13, 15 and 16 are pending in the application.

Claims 5, 12 and 13 are amended as suggested in the Official Action to address the claim objections noted in the Official Action.

Claims 1-16 were rejected under 35 USC 112, second paragraph. Claims 1 and 13 are amended to remove the word "type" and claim 11 is amended to provide proper antecedent basis for the recited "main bearing". Accordingly, the rejection is believed addressed and withdrawal of the same is respectfully requested.

Claims 1-5, 7-12, 15 and 16 were rejected under 35 USC 102(b) as being anticipated by WO 02/079644. That rejection is respectfully traversed.

Claim 1 recites that at least some bearings of a planetary gear transmission unit are taper roller bearings.

The position set forth in the Official Action is that at least some of the bearings of WO '644 seem to be inclined rollers as shown in the figures.

However, this characterization of WO '644 is not supported by the disclosure of this reference. Rather, page 2, lines 14-17 and page 5, lines 17-21 and claim 2 of WO '644 disclose that "each planetary wheel of each set of planetary twin wheels is mounted on the bogie shaft by means of a double spherical roller bearing, preferably a radial-axial-roller bearing, the rollers of which can run in a common spherical track in an outer race of the bearing".

Such double spherical roller bearings do not meet the recited taper roller bearings. Rather, spherical roller bearings have two rows of rollers with a common sphered raceway in the outer ring. The two inner raceways are inclined at an angle to the bearing axis. The bearings are self-aligning and consequently insensitive to errors of alignment of the shaft relative to the housing, and to the shaft bending. See for example the first paragraph of the SKF article entitled "Spherical Roller Bearings" submitted herewith.

Spherical bearings have a design such that they are inherently self-aligning, i.e., misalignment between the outer ring and the inner ring can be accommodated without any effect on the bearing.

Such a spherical roller bearing differs from the recited taper roller bearing in that the taper roller bearings do not provide the self-aligning function providing a degree of freedom that was believed necessary by the prior art planetary gear transmissions.

In view of the above, it is apparent that the bearings of WO '644 are different than the recited taper roller bearings. As WO '644 fails to disclose taper roller bearings, the reference does not anticipate.

The dependent claims are believed patentable at least for depending from an allowable independent claim.

In addition, at least claim 5 is believed to further define over WO '644 in that WO '644 fails to disclose that each gear of a pair is mounted on a pair of taper roller bearings.

First of all, as set forth above, the bearings of WO '644 are not taper roller bearings and rather are double spherical bearings. In any event, each planet gear 17a and 17b of WO '644 is supported by just one bearing, the bearing has two rows of rollers. Such does not meet the recited each planet gear is mounted on a pair of taper roller bearings.

Claims 1-13, 15 and 16 were rejected under 35 USC 102(b) as being anticipated by WO 02/14690. That rejection is respectfully traversed.

The Official Action recognizes that WO '690 does not disclose taper roller bearings in a planetary gear transmission

unit but states it is well known in the art to use taper bearings in a main bearing.

Such an analysis is not proper as part of an anticipation rejection.

The Federal Circuit has held that one a claimed invention is not identically disclosed in a reference, and instead requires picking and choosing among a number of different options disclosed by the reference, the reference does not anticipate. *Mendenhall v. Astec Industries, Inc.*, 13 USPQ 2d 1913, 1928 (Tenn. 1988), aff'd, 13 USPQ 2d 1956 (Fed Cir 1989).

Picking the tapered bearings of a main gear and using such bearings in a planetary gear is not an anticipation rejection as the claimed invention is not identically disclosed in the reference.

From WO '690 it is known to use taper roller bearings in a main gear system. However, it is not known to use such bearings in a planetary gear unit. WO '690 does not disclose a planetary gear unit having a planet gear comprising a bogie plate which supports and locates circumferentially spaced planet gear bearings at least some of which are taper roller bearings.

Moreover, one of ordinary skill in the art would readily recognize that the purpose and requirements of a main bearing are completely different from the purpose and requirements of planetary gear bearings. Therefore, not only does WO '690 fail to disclose taper roller bearings in a

planetary gear system, but also, it would not have been obvious to modify the planetary gear system of WO '690 to include taper bearings. Accordingly, reconsideration and withdrawal of the rejection are respectfully requested.

Claims 1-13, 15 and 16 were rejected under 35 USC 102(b) as being anticipated by WO 03/014566. That rejection is respectfully traversed.

Similarly to WO '690, the Examiner recognizes that WO '566 does not use taper bearings in a planetary gear system but uses such bearings in a main bearing.

However, as set forth above with respect to WO '690, as the claimed invention is not identically disclosed in the reference, then WO '566 does not anticipate. Reconsideration and withdrawal of the rejection are respectfully requested.

Claim 6 was rejected under 35 USC 103(a) as being unpatentable over WO 02/079644 in view of WO '690 and WO '566. That rejection is respectfully traversed.

Claim 6 depends from claim 1 and further defines the invention and is believed to define over the proposed combination of references at least for depending from an allowable independent claim.

In addition, as argued above, none of the references disclose taper roller bearings in a planetary gear unit. Moreover, it would not have been obvious to use taper bearings in the planetary gear unit based on the teachings of the references.

The references teach taper bearings in a main bearing. However, a main bearing takes a load from a rotor and transmits this load to the wind turbine housing. Therefore, the main bearing is preferably robust and one would seek to use a taper bearing for this feature in order to keep the misalignment between the rotor and the housing as small as possible.

In contrast, the purpose of the planetary gear bearings is to rotatably support the planetary gears with respect to the planet shafts. An object of such a system is to transmit torque and not to transmit bending moments and loads from the rotor. Therefore, the planetary gears are not subject to the stresses of a main gear. In view of this, it was commonly accepted in the prior art that planetary gear bearings should have a certain degree of freedom in order to compensate for certain misalignment of the gears so that damage to the gear toothing is avoided. Thus, as taught by the prior art, spherical roller bearings were used in the planetary gear system.

Nothing in the prior art references suggests the use of taper roller bearings in a planetary gear system. Claim 19 of WO '566 offered in the Official Action for this feature recites "a drive assembly according to claim 20, wherein the inner bearing is secured axially between said shoulder and said supporting structure".

There is nothing in this claim of WO '566 that is pertinent to taper roller bearings in a planetary gear system.

The Official Action also offers claim 21 of WO '690 as teaching taper roller bearings in an O configuration.

However, claim 21 of WO '690 refers to preceding claims 18-20 which are directed to characteristics of the main bearing and are not directed to the planet gear bearings. Therefore, the Examiner's characterization of WO '690 is incorrect.

As the above noted taper roller bearing in a planetary gear system is missing from each of the references, and is absent from the combination, the proposed combination of references does not meet the claims.

Claim 13 was rejected under 35 USC 103(a) as being unpatentable over WO '644 in view of WO '690 and WO '566. That rejection is respectfully traversed.

Claim 13 depends from claim 1 and is believed patentable over the proposed combination of references at least for depending from an allowable independent claim.

In addition, the Examiner's characterization of claim 13 with respect to WO '690 and WO '566 is inconsistent with the disclosure of these references.

The Examiner offers shaft 26 in Figure 3 of WO '690 and WO '566 in support of the assertion that shaft 26 is a flexpin shaft.

Page 5, lines 13-18 of the present application disclose that a flexpin shaft as recited is as described in GB 1,101,131.

Page 1, lines 44-65 of GB 1,101,131 disclose a flexpin shaft as follows:

> "In accordance with the present invention a gear wheel is mounted on one end of a co-axial resilient spindle the other end of the spindle being mounted on a carrier, a space being provided in the bore of the gear wheel to permit the spindle to flex so that the gear wheel will locate with uniform loading and the mountings of the spindle being such that when the spindle flexes due to the presence of radial loads acting effectively mid-way across the face of the gear wheels the axis of the gear wheel remains parallel to the position of its axis when the spindle is unflexed.
>
> Preferably a tubular sleeve is interposed between the gear and shaft, the sleeve having a smaller diameter bore portion which is fast with the shaft and a larger diameter bore portion which creates an annular space about the shaft in which the latter may deflect, the gear being located wholly about the larger diameter portions of the sleeve."

From the above, it is clear that the shaft 26 in Figure 3 of WO '960 and WO '566 does not meet the above description of a flexpin shaft since no annular space is created on the planetary shaft so that no space is available around the planet shaft in which the shaft can deflect with regard to the planet gear.

As such, claim 13 is believed to define over the proposed combination of references.

Claims 1-7, 10-12, 15 and 16 were rejected under the grounds of non-statutory obviousness-type double patenting as being unpatentable over claims 1-4, 10, 13 and 19 of U.S. Patent No. 7,090,465. That rejection is respectfully traversed.

Claims 1-7, 10-12, 15 and 16 of the present application recite a taper roller bearing in a planetary gear unit.

The claims of 7,090,465 are not directed to a taper roller bearing in a planetary gear system and thus, the '465 patent neither anticipates nor would render obvious claims 1-7, 10-12, 15 and 16 of the present application. Accordingly, withdrawal of the obviousness-type double patenting rejection is respectfully requested.

In view of the present amendment and the foregoing Remarks, the present application has been placed in condition for allowance. Reconsideration and allowance are respectfully requested.

The Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 25-0120 for any additional fees required under 37 C.F.R. § 1.16 or under 37 C.F.R. § 1.17.

Respectfully submitted,

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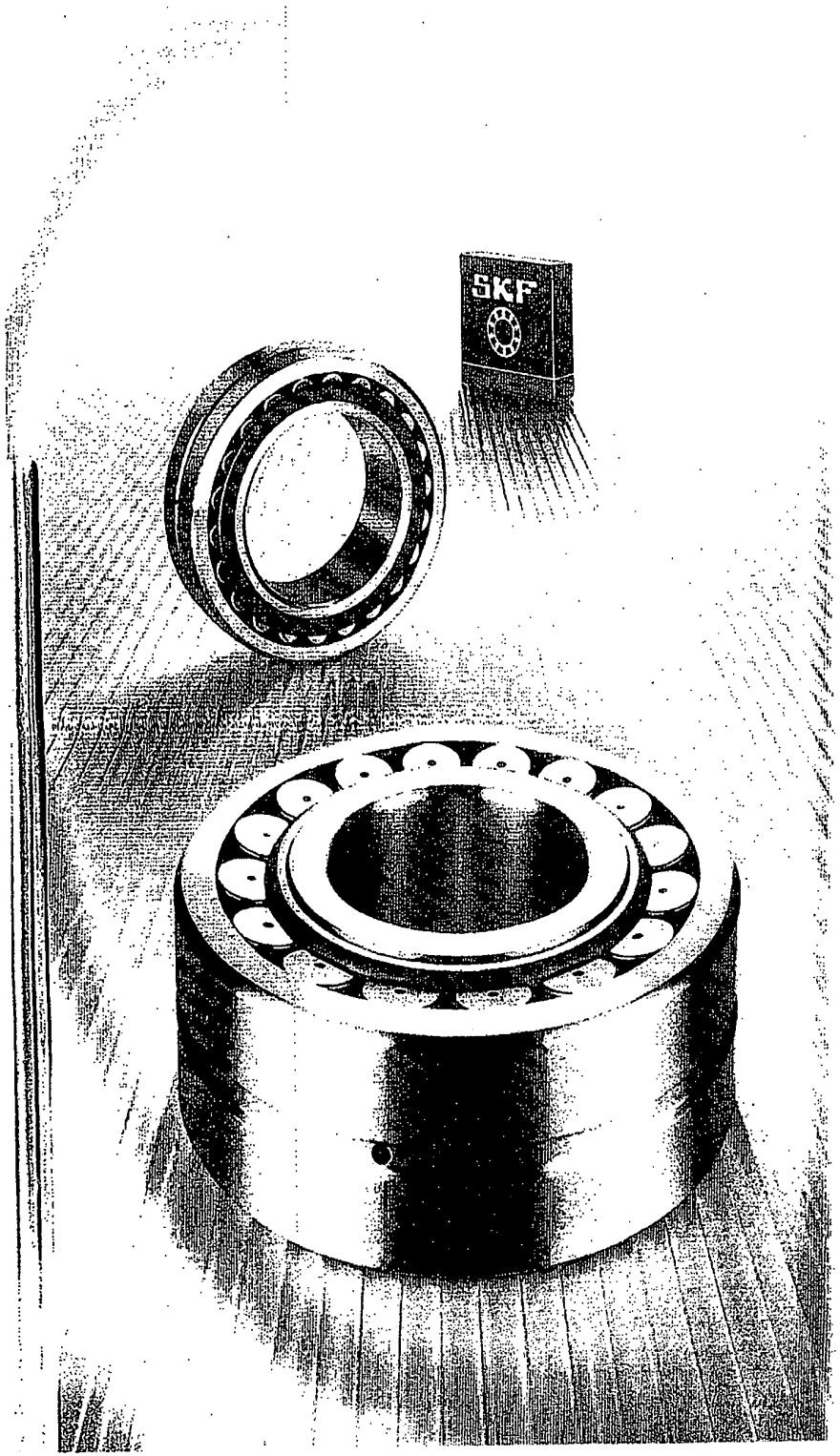
APPENDIX:

- "Spherical Roller Bearings"



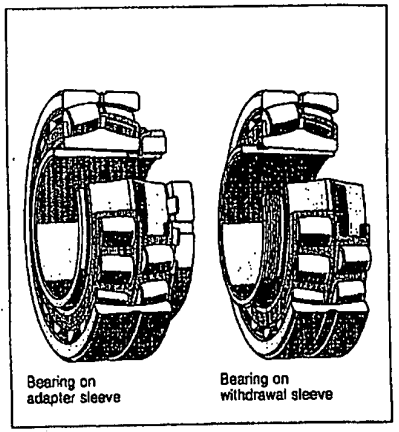
Spherical roller bearings

Spherical roller bearings have two rows of rollers with a common sphered raceway in the outer ring. The two inner ring raceways are inclined at an angle to the bearing axis. The bearings are self-aligning and consequently insensitive to errors of alignment of the shaft relative to the housing, and to shaft bending. In addition to radial loads, the bearings can also accommodate axial loads acting in both directions.

SKF spherical roller bearings have a large number of long, symmetrical rollers of large diameter and consequently very high load carrying capacity. Their internal design differs slightly depending on series and size, but has been continually improved over the years. The special raceway form and optimised surface finish of the raceways ensure that the bearings, especially those of the E, CC and CAC designs, have a minimum of friction. These bearings have lower operating temperatures or can accommodate heavier axial loads, or can be operated at higher speeds than conventional spherical roller bearings. The E design constitutes the new SKF standard design for spherical roller bearings and is being gradually introduced, starting with the smaller sizes of series 222 and 223.

SKF spherical roller bearings are available with cylindrical bore and tapered bore. The tapered bore of bearings of series 240 and 241 has a taper of 1:30 (designation suffix K30) whereas that of all other bearings has a taper of 1:12 (suffix K).

SKF supplies adapter and withdrawal sleeves which can be used to mount spherical roller bearings with tapered bore on smooth or stepped shafts easily and quickly. Data for spherical roller bearings with appropriate adapter and withdrawal sleeves will be found in the tables commencing on pages 490 and 500, respectively. More detailed information on the sleeves will be found in the section "Accessories".



Bearing on adapter sleeve

Bearing on withdrawal sleeve

Designs

SKF spherical roller bearings are made to one of the designs described and illustrated in the following, depending on size and series.

CC, C and EC designs

These bearings have symmetrical rollers, a flangeless inner ring and a pressed steel cage for each roller row. The guide ring is centred on the inner ring. EC design bearings incorporate reinforced roller sets for added load carrying capacity. The surface finish of the rollers and raceways of bearings of the CC design has been optimised to promote roller guidance and reduce friction.

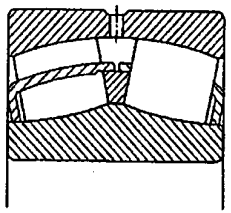
CAC, ECAC, CA and ECA designs

These designs are used for the larger sizes of SKF spherical roller bearings. The rollers are symmetrical and the inner ring has retaining flanges. The guide ring is centred on the inner ring between the two rows of rollers and the cage is a one-piece, double pronged machined cage of brass or steel. The CAC and ECAC designs incorporate the surface finish refinements of the CC design and the ECAC and ECA designs have reinforced roller complements for increased load carrying capacity.

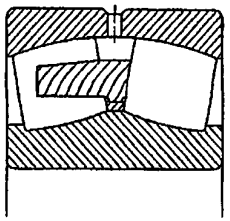
E design

The bearings of this new standard SKF design have symmetrical rollers, a flangeless inner ring, and a sintered guide ring, positioned towards the outer ring and centred on the cages, one pressed steel cage being used for each row of rollers.

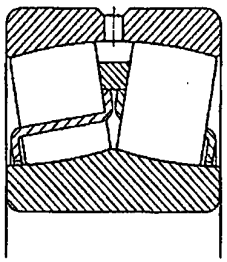
The E design bearings incorporate all the advantages of the well-proven SKF CC bearings as well as additional refinements. The pressed steel cages have been newly developed and permit the inclusion of a greater number and/or larger diameter rollers of increased length, imparting even higher load carrying capacity to the bearings.



CC, C and EC designs



CAC, ECAC, CA and ECA designs



E design

The positioning of the guide ring towards the outer ring enables lubrication at the roller end/guide ring contact to be improved. The guide ring contributes to the reduced friction in the bearing as it helps to guide the rollers in the unloaded zone and assists their entry into the loaded zone.

Annular groove and lubrication holes

To facilitate efficient bearing lubrication all SKF spherical roller bearings are provided with an annular groove and three lubrication holes in the outer ring as standard except those of series 213 CC and CC design bearings having an outside diameter smaller than 150 or 180 mm (depending on series). Designation suffix W33 is used to identify this feature on bearings of the CC, C, EC, CAC, ECAC, CA and ECA designs. The suffix is not used with the E design bearings as the lubrication groove and three holes feature is an integral part of the new standard E design. If E design bearings are required without this feature, then suffix W must be added to the bearing designation, e.g. 22312 EW or 22312 EKW.

Sealed bearings

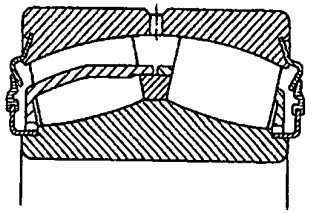
For bearing arrangements where loads are heavy and operating conditions very arduous, and where particular demands are made with regard to sealing, SKF can supply spherical roller bearings with integral rubbing seals at both sides. The seals comprise two washers, one being attached to the outer and one to the inner ring of the bearing. The pressed steel washers are protected against corrosion. The inner ring seal washer has a vulcanised sealing lip of fluoro rubber which effectively protects the bearing against the penetration of contaminants; when the inner ring rotates, the washer acts as a flinger. The seal washers protrude from the side face of the bearing, so that additional lateral space is required for the sealed bearings. However, it is possible in many cases to replace unsealed bearings with sealed bearings in existing bearing arrangements.

SKF sealed spherical roller bearings permit misalignments of up to 0,5° of the inner ring with respect to the outer ring in applications where the inner ring rotates. The material of the sealing lip limits the operating temperature range for these bearings to the range −30 to +150 °C. The bearings are filled with an appropriate quantity of rust inhibiting lithium base grease having an operating temperature range of −30 to +110 °C. On request, however, the bearings can be supplied with other greases.

Under many operating conditions, sealed spherical roller bearings may not require relubrication. However, where loads are heavy or the bearings operate at high speeds, or at temperatures above +70 °C, they should be relubricated. This may be achieved via the annular groove and lubrication holes in the outer ring.

Details regarding sealed spherical roller bearings will be supplied on request.

Sealed spherical roller bearing



Spherical roller bearings for vibrating screens

For screens and other vibrating applications, SKF has developed special bearings. They have the same dimensions and other product data as the bearings of series 223 CC(K). The screen bearings are made in two different designs depending on bearing size and differ from the original CC design bearings in that they incorporate surface hardened window-type pressed steel cages having high wear resistance. The larger bearings with a bore diameter of 75 mm and above have a guide ring which is centred in the outer ring raceway instead of on the inner ring. A further characteristic of these screen bearings is their special clearance which lies in the range of the upper half of C3 and the lower half of C4.

SKF spherical roller bearings for vibrating applications are available with cylindrical as well as tapered bore for the shaft diameter range 40 to 200 mm, inclusive. The smaller bearings with bore diameter up to and including 70 mm are identified by the designation suffix A15, e.g. 22314 CC/W33A15, whilst the larger sizes carry the suffixes JA and VA405, e.g. 22320 CCJA/W33VA405.

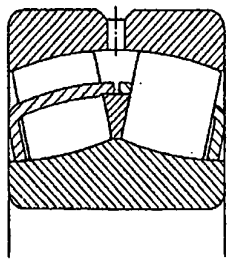
To prevent fretting corrosion, bearings having a bore diameter of 75 mm and above can also be supplied with a PTFE layer lining the cylindrical bore. The bearings having this lined bore have the same dimensions as the standard screen bearings but the bore diameter tolerances are not standard. These bearings are identified by suffix VA406, e.g. 22324 CCJA/W33VA406.

More detailed information on spherical roller bearings for vibrating applications can be obtained from special publications which will be supplied on request.

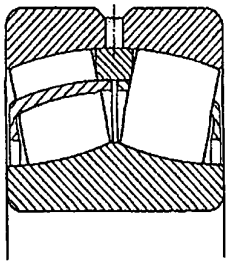
Other spherical roller bearings

In addition to the spherical roller bearings listed in the following tables, SKF produces other sizes and series. Details will be found in the SKF catalogue "Bearings for heavy engineering applications".

Spherical roller bearings for vibrating applications



Bearings with bore diameter d < 75 mm



Bearings with bore diameter d ≥ 75 mm

Dimensions

The boundary dimensions of the bearings listed in the tables conform to ISO 15-1981.

Misalignment

Spherical roller bearings have a design such that they are inherently self-aligning, i.e. misalignment between the outer ring and inner ring can be accommodated without any effect on the bearing. Under normal loads and operating conditions, and when the inner ring rotates, the guideline values of misalignment given in the adjacent table are permitted. Whether these values can be fully exploited or not depends on the design of the bearing arrangement, the type of seals used etc.

Bearings	Permissible angular misalignment
–	degrees
Series 213	1
Series 222	1,5
Series 223	2
Series 230	1,5
Series 231	1,5
Series 232	2,5
Series 239	1,5
Series 240	2
Series 241	2,5

Tolerances

SKF spherical roller bearings with cylindrical and tapered bores are produced as standard with normal tolerances. The values of these tolerances will be found in the table on page 74.

Internal clearance

SKF spherical roller bearings are manufactured as standard with Normal radial internal clearance. Nearly all the bearings are also available with the larger C3 clearance and some can be supplied with the even larger C4 clearance. Some sizes can be delivered with C2 clearance which is smaller than Normal. The availability of bearings with radial internal clearances other than Normal (including C5) should be checked before ordering. The limits for the various clearances will be found in the tables on pages 464 and 465 and are in accordance with ISO 5753-1981, where $d \leq 1\,000$ mm. They are valid for zero measuring load and before mounting.

Spherical roller bearings

Spherical roller bearings have two rows of rollers with a common sphered raceway in the outer ring and two inner ring raceways inclined at an angle to the bearing axis (fig 1). This gives them an attractive combination of design features making them irreplaceable in many demanding applications. They are self-aligning and consequently insensitive to misalignment of the shaft relative to the housing and to shaft deflection or bending.

SKF spherical roller bearings are leading in design and can, in addition to high radial loads, accommodate high axial loads acting in both directions.

The standard range of SKF spherical roller bearings comprises

- open bearings
- sealed bearings
- bearings for vibratory applications.

In addition to the standard range, SKF offers a wide range of special spherical roller bearings adapted for specific applications.

Product table

Spherical roll
Spherical r bearings
Open bearii
Sealed bea
Bearings fo applications
SKF Explor bearings
Special bea
Bearings or
Appropriate housings
Dimensions
Tolerances
Internal cle
Misalignme
Influence o temperatur material
Axial load c capacity
Minimum lo
Equivalent bearing loa
Equivalent load
Supplemen designation
Mounting b a tapered b